Document Title:	Function Group:	Information Type:	Date:
General description	**200**	**Service Information**	**2014/4/16**
Profile: **WLO, L220D [GB]**			

General description

The loader is equipped with an engine type TD122KLE.

The engine is a straight, six-cylinder, four-stroke, direct-injection, turbocharged diesel engine with a water-cooled intercooler.

The engine is of the low-emission version.

The engine type designation, part number and serial number are stamped into the left side of the cylinder block.

The engine is installed in a closed space to reduce the external sound level.

The coolant pump is a double pump for separate cooling of the engine and the intercooler.

The cooling fan with vane motor is positioned behind the radiator and is hydrostatically driven by a variable piston pump, Pump 3, (P 3).

The fan speed is controlled by the vehicle ECU (V-ECU), which receives information about the temperature in the following systems:

- Coolant temperature
- Transmission oil temperature
- Hydraulic oil temperature
- Temperature in the front and rear axles (only if the machine is equipped with axle oil cooler.)

The hydrostatically controlled cooling fan speed results in higher engine output and a low sound level, as the cooling fan does not often work at maximum speed.

The cooling system is based on a concept where the cooling of the engine, transmission, hydraulics and axle oil cooling, (optional equipment) is integrated.
The cooling of these systems depends on the cooling fan speed.

Document Title: **Idling speed, checking and adjusting**	Function Group: **236**	Information Type: **Service Information**	Date: **2014/4/16**
Profile: **WLO, L220D [GB]**			

Idling speed, checking and adjusting

Op nbr 23601

The following applies when checking:

Temperature:	**Normal working temperature**
Low idling speed:	**750 50 rpm**
High idling speed:	**2200 50 rpm**

Units using a lot of electricity and the air conditioning, if applicable, must be turned off.

1. Select information about the engine and speed on operator display unit.

Low idling speed, checking and adjusting

2. Check, with the engine turned off, that the governor lever fits up against adjusting screw 3, see figure. Start the engine and read off the low idling speed on the display unit. Adjust with adjusting screw 3. Lock the adjusting screw with the nut and check the speed.

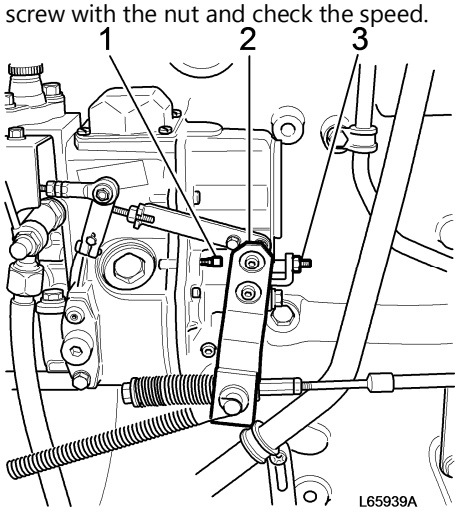

Figure 1
Idling speed, checking and adjusting

1. Stop screw, high idling speed
2. Governor control arm, accelerator control
3. Adjusting screw, low idling speed

High idling speed, checking

3. With the engine turned off, check that the governor lever is limited by stop screw 1, see figure, when the

accelerator pedal is trodden right down. Let up the accelerator pedal, start the engine and depress the accelerator pedal fully, so that the governor lever fits up against adjusting screw 1. Read off the high idling speed on the display unit.

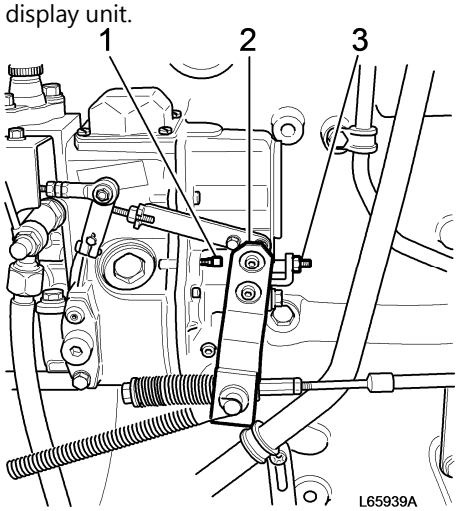

Figure 2
Idling speed, checking and adjusting

1. Stop screw, high idling speed
2. Governor control arm, accelerator control
3. Adjusting screw, low idling speed

4. Any adjustment of the high idling speed must only be carried out by a diesel workshop authorised by Bosch.

Document Title:	Function Group:	Information Type:	Date:
Stall speed, checking	**236**	**Service Information**	**2014/4/16**
Profile: **WLO, L220D [GB]**			

Stall speed, checking

Op nbr 23602

The following applies when checking:

Temperature:	**Normal working temperature**
Stall speed	**1780 ±50 rpm**
High idling speed:	**2200 ±50 rpm**

Units using a lot of electricity and the air conditioning (if applicable) should be turned off.

1. Check the high idling speed of the engine on the display unit.
2. Set Mode Selector SW143 to the Manual position, apply the service and parking brakes. Engage 3rd gear forward.
3. Run the engine at maximum speed and read off the stall speed.

   NOTE!
   If the recorded speed is higher than the prescribed stall speed, this may be due to the torque converter, the transmission because of, for example, too low pressures. If the speed is lower than the prescribed, this may be caused by the torque converter or the engine, or their peripherals, being in a poor condition. A deviating stall speed is not necessarily a fault in itself which requires to be corrected, but should be used as an aid during trouble-shooting.

Document Title:	Function Group:	Information Type:	Date:
Injection angle (injection timing), checking and adjusting	**236**	**Service Information**	**2014/4/16**
Profile: **WLO, L220D [GB]**			

Injection angle (injection timing), checking and adjusting

Op nbr 23630

998 7057 Timing tool
999 3590 Gear
999 3625 Guide
999 3824 Bolt

The following applies when checking:

Injection angle (timing)	**11° ±0.5° B.T.D.C.**

Checking

1. Turn off the battery disconnect switch.
   Open the right engine cover on the machine.

2. Remove the plug from the governor housing and install the timing tool sensor.
   NOTE!
   The governor housing contains oil.

3. Connect the timing tool ground cable to ground in a suitable place on the injection pump.

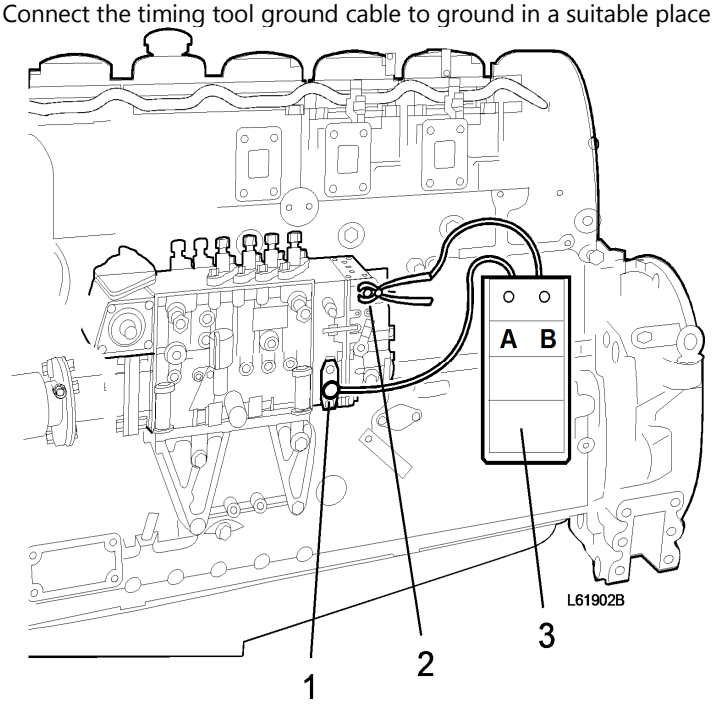

Figure 1
Injection angle (injection timing), checking (principle diagram)

1. Sensor
2. Ground cable
3. 998 7057

4. Remove the cover from the flywheel housing and install the tools.
   Rotate the flywheel **in the direction of rotation of the engine** until both light emitting diodes light up. The graduation on the flywheel should now be visible.

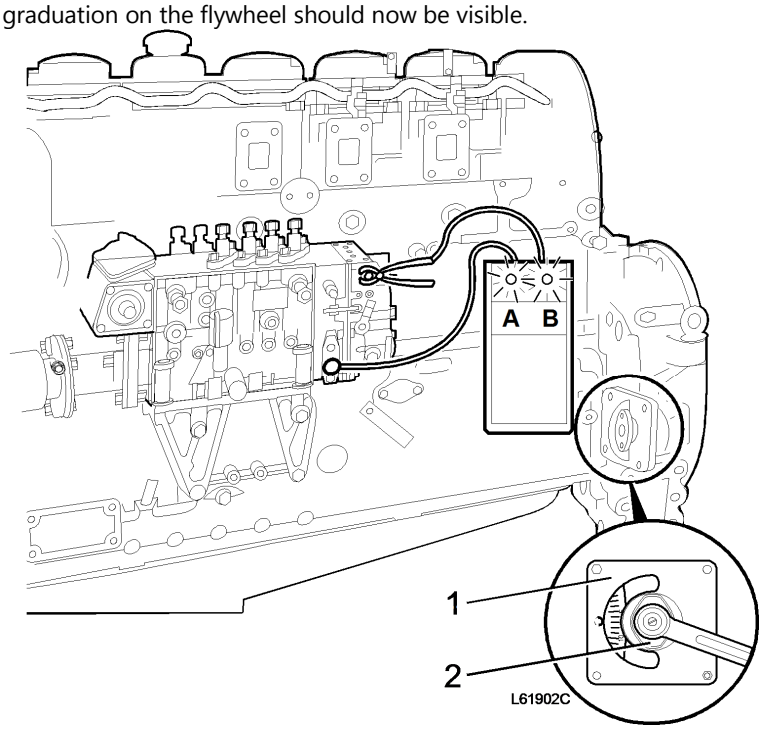

Figure 2
Injection angle (injection timing), checking (principle diagram)

1. 999 3625
2. 999 3590

5. Rotate the flywheel **against the direction of rotation of the engine** approx. 1/4 of a turn.

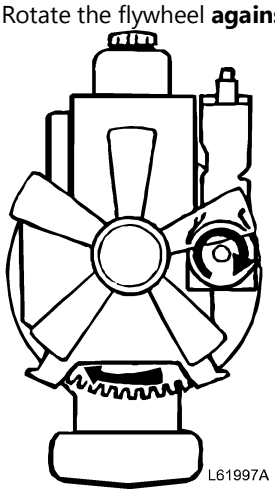

Figure 3
Direction of rotation of engine and injection pump

6. Slowly rotate the flywheel **in the direction of rotation of the engine** until both light emitting diodes light up. Read off the graduation on the flywheel by the pointer. If the correct number of degrees are shown on the flywheel, remove the tools and reset the machine.
   Adjust when necessary and carry out a new check.

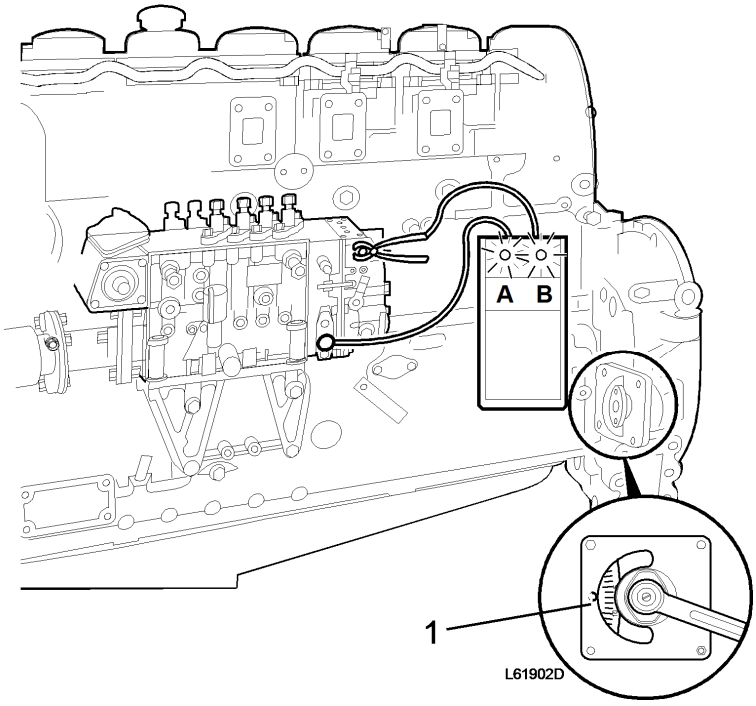

Figure 4
Injection angle (injection timing), checking (principle diagram)

1. Graduation on flywheel

Adjusting

7. Rotate the flywheel **against the direction of rotation of the engine** approx. 1/4 of a turn.

8. Rotate the flywheel **in the direction of rotation of the engine** until the correct number of degrees for the engine appear by the indicator point.
   NOTE!
   Set the flywheel to a number of degrees within the higher end of the tolerance range. Make the adjustment carefully and do not turn the flywheel back against the direction of rotation in order to fine-adjust the flywheel position. If the flywheel has been been turned too far, the adjustment must be done over again.

9. Remove the guard over the pump coupling.

10. Remove the security seal from the clamping bolt

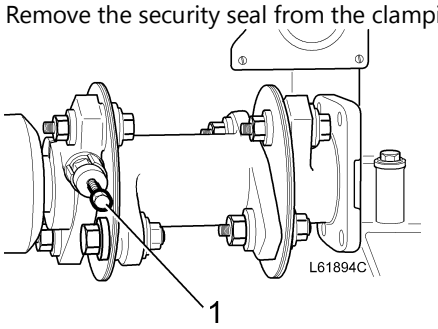

Figure 5
Removing security seal

1. 999 3824

11. Turn the injection pump shaft until both light emitting diodes on the timing tool is light.
    NOTE!
    The timing tool is very sensitive in order allow an exact adjustment.

12. Tighten down the clamping bolt.
    Check the injection angle (timing).

13. Install the security seal on the clamping bolt.

14. Remove the plug from the governor housing and install the timing tool sensor.

15. Remove the tools from the flywheel housing and install the cover.

16. Install the guard over the pump coupling.

Document Title:	Function Group:	Information Type:	Date:
Cooling system, description	**260**	**Service Information**	**2014/4/16**
Profile: **WLO, L220D [GB]**			

Cooling system, description

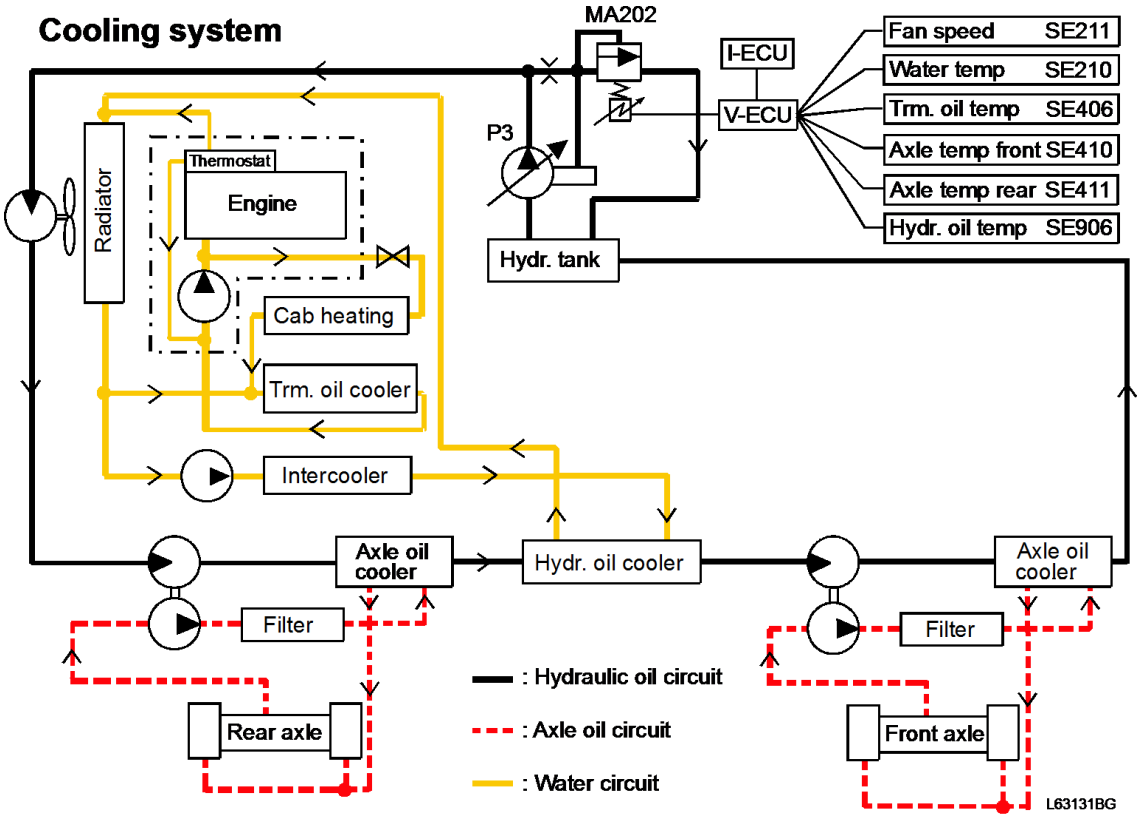

Figure 1
Cooling system

The advantages of the system integrated cooling system is:

- Higher engine output and lower sound level as the cooling fan rarely works at maximum speed.
- Faster warming up of the transmission.
- Faster warming up of the drive axles, and that the axle oil always circulates in the axles also when the machine is stationary. (Applies if the machine is equipped with extra axle oil cooling).
- Warming of the oil in the hydraulic oil tank, also during transport operation.
- Improved heating of the cab because of a higher flow of warm water through the heating radiator in the cab even at a low engine speed.

VOLVO
Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Pump 3 (P3) Cooling fan pump / Brake pump Flow and pressure control, description	**260**	**Service Information**	**2014/4/16**
Profile: **WLO, L220D [GB]**			

Pump 3 (P3) Cooling fan pump / Brake pump Flow and pressure control, description

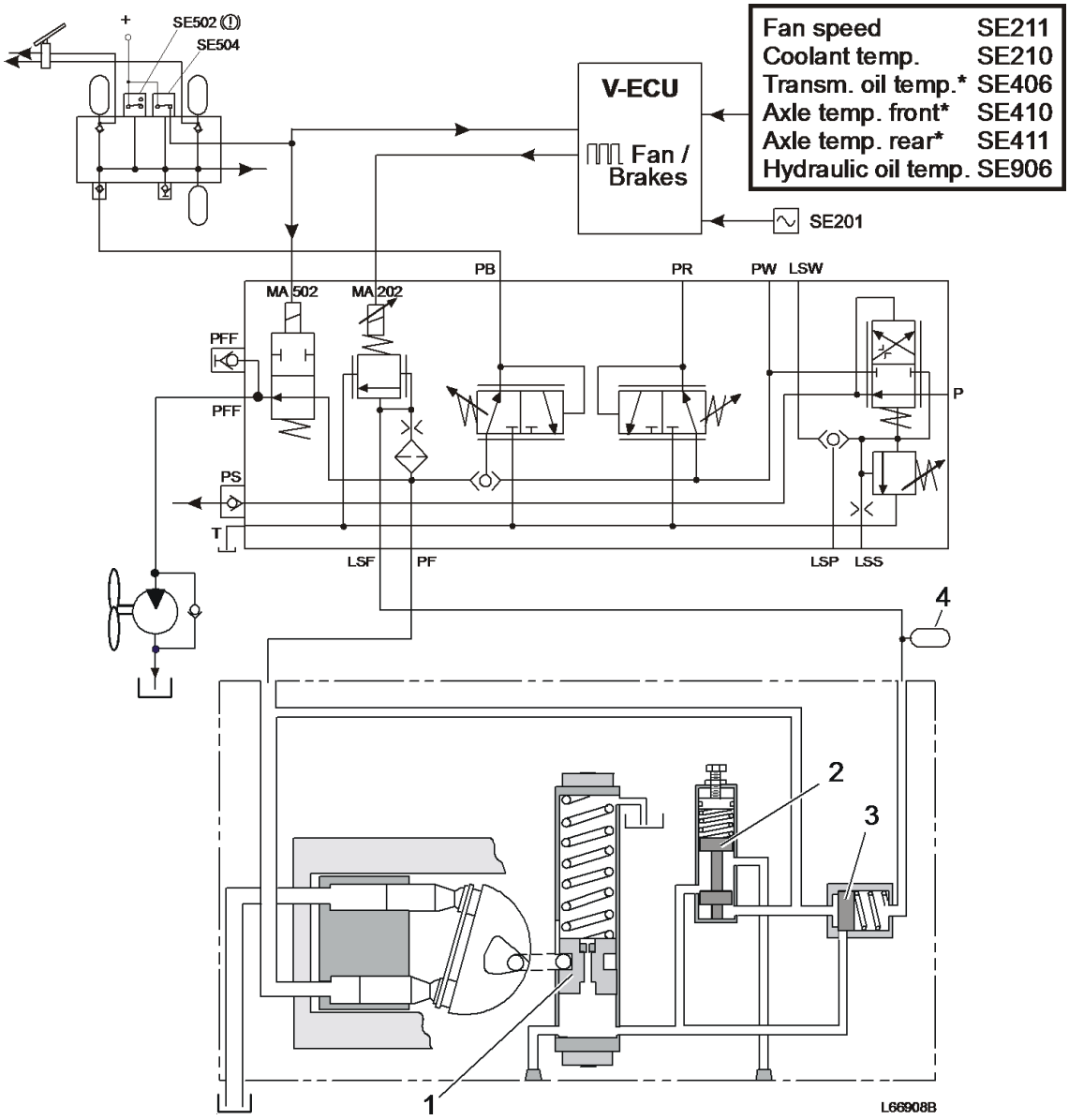

Figure 1
Pump 3 (P3) Cooling fan pump / Brake pump, Flow and pressure control

1. Control piston
2. Pressure compensator
3. Flow compensator

4. Accumulator, introduced on L220D / 1324–, to dampen pulses in LS-line

VOLVO

Construction Equipment

Service Information

Document Title: **Cooling fan motor, description**	Function Group: **263**	Information Type: **Service Information**	Date: **2014/4/16**
Profile: **WLO, L220D [GB]**			

Cooling fan motor, description

The cooling fan is driven by a vane motor with fixed displacement.

On machines equipped with external axle oil cooling, there is a non-return valve installed in a block on the connections for the vane motor. The purpose of the non-return valve is to avoid cavitation in the vane motor when the engine is stopped and the cooling fan is still rotating.

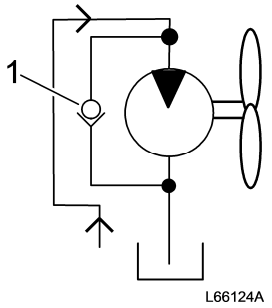

Figure 1
Cooling fan motor, principle diagram

1. Non-return valve, (only on machine with external axle oil cooling)

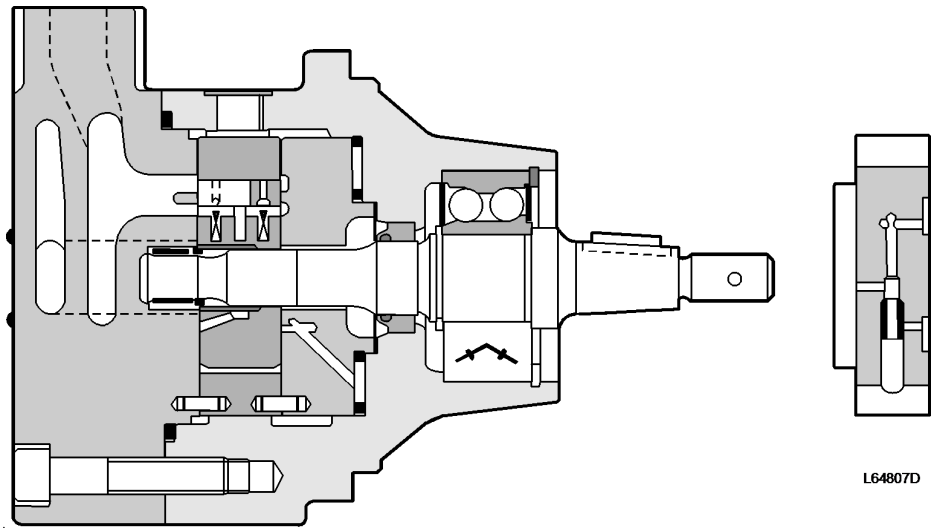

Figure 2
Cooling fan motor

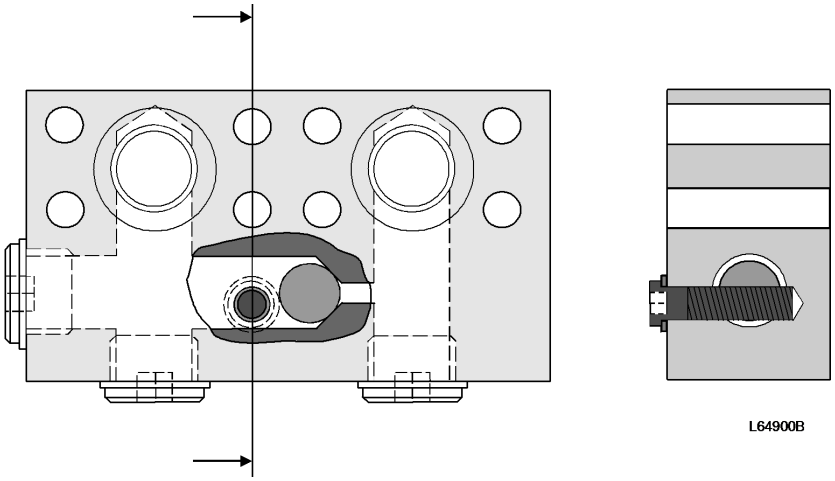

Figure 3
Non-return valve, sectional view

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